



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,578	11/24/2003	Chih-Ming Lin	67,200-1158	5800

7590 12/19/2005

TUNG & ASSOCIATES  
Suite 120  
838 W. Long Lake Road  
Bloomfield Hills, MI 48302

EXAMINER

RAO, SHRINIVAS H

ART UNIT	PAPER NUMBER
2814	

DATE MAILED: 12/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/721,578	<b>Applicant(s)</b> LIN ET AL.	
	<b>Examiner</b> Steven H. Rao	<b>Art Unit</b> 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/24/2003</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

The Application as currently filed does not claim priority from any prior filed patent application. Therefore currently the earliest available filing date is the U.S. filing date namely November 24, 2003.

### ***Information Disclosure Statement***

The IDS filed on 11/24/2003 has been considered. The initialed copy of the PTO-1449 is enclosed herewith and the contract staff instructed to mail a copy of the same along with this Office Action.

### ***Specification***

The specification is objected to because elements 28 a and 28 b identified in the drawings for which no description is provided in the specification.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 to 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Knall et al. (U.S. Patent No. 6,420,215, herein after Knall).

With respect to claim 1 Knall describes an anti-fuse structure comprising : a substrate having formed therein a contact region; ( Knall fig. 1 #10, col. 2 line 60) a metal silicide layer formed over and electrically connected with the contact region; (

Art Unit: 2814

Knall fig. 1 # 14) a first doped polysilicon layer formed upon the metal silicide layer; ( Knall fig. 1 # 15) an anti-fuse material layer formed upon the first doped polysilicon layer; (Knall fig. 1 # 20 ) and a second doped polysilicon layer formed upon the anti-fuse material layer. ( fig. 1 # 21, col. 3 line 60).

With respect to claim 2 Knall describes the anti-fuse structure of claim 1 wherein the metal silicide layer is formed from a metal selected from the group consisting of titanium, tungsten, cobalt, nickel, platinum, vanadium and molybdenum metals. ( Knall col.3 lines 23-27) .

With respect to claim 3 Knall describes the anti-fuse structure of claim wherein the anti-fuse material layer is formed from an anti-fuse material selected from the group consisting of amorphous silicon materials, amorphous carbon materials and dielectric materials. ( Knall col. 3 lines 40-58).

With respect to claim 4 Knall describes the anti-fuse structure of claim I wherein a doped polysilicon layer is not formed interposed between the contact region and the metal silicide layer. ( Knall figures 1,3,5, etc.)

With respect to claim 5 describes the anti-fuse structure of claim further comprising a barrier layer formed interposed between the contact region and the metal silicide layer and contacting the metal silicide layer. ( Knall col.5 lines 35-47, dielectric layer) .

With respect to claim 6 Knall describes an anti-fuse structure comprising: a substrate having formed therein a contact region; a metal silicide layer formed over and electrically connected with the contact region; a first doped polysilicon layer of a first

Art Unit: 2814

polarity formed upon the metal silicide layer; an anti-fuse material layer formed upon the first doped polysilicon layer; and a second doped polysilicon layer of a second polarity opposite the first polarity formed upon the anti-fuse material layer. ( Knall figure 3).

With respect to claim 7 describes the anti-fuse structure of claim 6 wherein the metal silicide layer is formed from a metal selected from the group consisting of titanium, tungsten, cobalt, nickel, platinum, vanadium and molybdenum metals. ( rejected for reasons set out under claim 2 above).

With respect to claim 8 Knall describes the anti-fuse structure of claim 6 wherein the anti-fuse material layer is formed from an anti-fuse material selected from the group consisting amorphous silicon materials, amorphous carbon materials and dielectric materials. ( rejected for reasons set out under claim 3 above).

With respect to claim 9 Knall describes the anti-fuse structure claim 6 wherein a doped polysilicon layer is not formed interposed between the contact region and the metal silicide layer. ( rejected for reasons set out under claim 4 above).

With respect to claim 10 Knall describes the anti-fuse structure of claim 6 further comprising a barrier layer formed interposed between the contact region and the metal silicide layer and contacting the metal silicide layer. ( rejected for reasons set out under claim 5 above).

With respect to claim 11 Knall describes a method for forming an anti-fuse structure comprising: providing a substrate having formed therein a contact region; forming a metal silicide layer over and electrically connected with the contact region; forming a first doped polysilicon layer upon the metal silicide layer; forming an anti-fuse

Art Unit: 2814

material layer upon the first doped polysilicon layer; and forming a second doped polysilicon layer upon the anti-fuse material layer.( Knall col.3 lines 29 to col. 4 lines 37).

With respect to claim 12 Knall describes the method of claim wherein the metal silicide layer is formed from a metal selected from the group consisting of titanium, tungsten, cobalt, nickel, platinum, vanadium and molybdenum metals. ( rejected for reasons set out under claims 2, 12).

With respect to claim 13 Knall describes the method of claim 11 wherein the anti-fuse material layer is formed from an anti-fuse material selected from the group consisting of amorphous silicon materials, amorphous carbon materials and dielectric materials. ( rejected for reasons set out under claims 3,13).

With respect to claim 14 describes the method of claim 11 wherein a doped polysilicon layer is not formed interposed between the contact region and the metal silicide layer. ( rejected for reasons set out under claims 4,14).

With respect to claim 15 Knall describes the method of claim further comprising forming a barrier layer interposed between the contact region and the metal silicide layer and contacting the metal silicide layer. ( rejected for reasons set out under claims 5,10).

With respect to claim 16 Knall describes a method for forming an anti-fuse structure comprising: providing a substrate having formed therein a contact region; forming a metal silicide layer over and electrically connected with the contact region; forming a first doped polysilicon layer of a first polarity upon the metal silicide layer; forming an anti-fuse material layer upon the first doped polysilicon layer; and forming a

Art Unit: 2814

second doped polysilicon layer of a second polarity opposite the first polarity upon the anti-fuse material layer. ( rejected for reasons set out under claim 6 above).

With respect to claim 17 Knall describes the method of claim 16 wherein the metal silicide layer is formed from a metal selected from the group consisting of titanium, tungsten, cobalt, nickel, platinum, vanadium and molybdenum metals. ( rejected for reasons set out under claims 2,12 above).

With respect to claim 18 describes the method of claim 16 wherein the anti-fuse material layer is formed from an anti-fuse material selected from the group consisting amorphous silicon materials, amorphous carbon materials and dielectric materials. ( rejected for reasons set out under claims 3, 13 ).

With respect to claim 19 describes the method of claim 16 wherein a doped polysilicon layer is not formed interposed between the contact region and the metal silicide layer. ( rejected for reasons set out under claim 5, 10 above).

With respect to claim 20 describes the method of claim further comprising forming a barrier layer interposed between the contact region and the metal silicide layer and contacting the metal silicide layer. ( rejected for reasons set out under claims 5,15 above).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. Rao whose telephone number is ( 571) 272-1718. The examiner can normally be reached on 8.00 to 5.00.

Art Unit: 2814

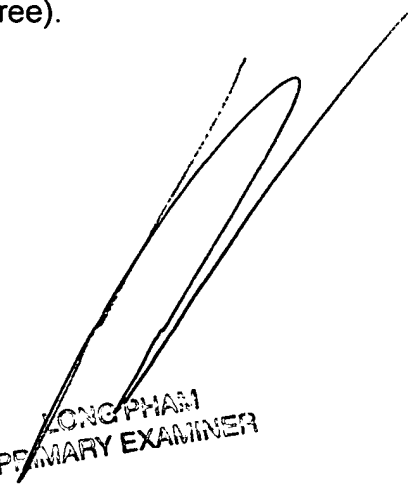
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fahmy Wael can be reached on (571) 272-1714. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Steven H. Rao

Patent Examiner

November 30, 2005.



LONG PHAM  
PRIMARY EXAMINER